Implicit Positivity: Improving Mood with Environmental Cues

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Abstract

Research in recent years has touted the benefits of positive emotions. However, new studies suggest that actively trying to be positive can backfire, leaving a person feeling worse than before. In this study, the efficacy of implicit goals of positivity as an alternate mechanism for mood improvement was investigated. All participants completed a negative mood induction before completing a thought task while being exposed to either positive or neutral environmental cues. During the task, participants were either asked to try to "improve their mood" or to list whatever thoughts came to their mind. A variety of measures, including number of thoughts, thought automaticity, thought valence, and degree of mood repair were collected across conditions. Despite research to the contrary, most participants experienced greater positivity when given an explicit goal to try to be positive. However, among participants prone to rumination, implicit goals were comparatively more effective in generating positivity. Though the implicit mechanism of environmental cues may not be effective for all people, it seems to be preferable for those with a tendency to dwell on negative thoughts. The possibilities for follow-up research and for practical applications of such findings are discussed.

Implicit Positivity: Improving Mood with Environmental Cues

In recent years, popular culture has touted the power of positivity, and with good reason. Evidence supporting the mental, social, psychological, and physical benefits of positive emotions abounds in psychological literature. Positive emotions have been found to increase cognitive breadth, leading to more creative (Isen, Daubman, & Nowicki, 1987), unusual (Isen, Johnson, Mertz, & Robinson, 1985), flexible (Isen & Daubman, 1984), and efficient (Isen & Means, 1983) thinking. These emotions promote stronger relationships (Aron et al., 2000), more unpredictable and interesting social interactions (Gottman, 1998), and reduced prejudice, aggression, and violence toward outgroup members (Bridgeman, 1981; Feshbach & Feshbach, 1982). They also help to de-escalate anger and interpersonal conflict (Gottman, 1998; Smith, 1973). Resilience and optimism have also been found to increase with positivity (Fredrickson et al., 2003). Furthermore, positive emotions have even been found to reduce life stress and related illness (Cousins, 1985; Fry, 1994; Kuiper & Martin, 1998; Stone et al., 1994), improve heart health via stronger vagal tone (Kok et al., 2013), and increase the length of the lifespan (Danner et al., 2001).

These findings can be summarized by Fredrickson's (1998) "broaden and build" theory, which states that positive emotions broaden an individual's patterns of cognition and serve to build the personal resources available to him or her. When experiencing positive emotions, people attend more to the peripheral details of their environment (Derryberry & Tucker, 1994) and can act with a broader variety of behavioral responses (Kahn & Isen, 1993). In contrast, negative emotions are more blatantly tied to survival and are associated with "specific action tendencies" (Fridja, 1986; Lazarus, 1991; Levenson, 1994). Emotions such as fear or anxiety trigger the notion that something in the environment is threatening and must be addressed (e.g.

LeDoux, 1996). These emotions thus narrow an individual's focus (Easterbrook, 1959) to identify the source of threat and limit their choice of action (Levenson, 1992) to best respond to the threat.

Positive and negative emotions thus appear to play contrasting roles. In fact, positive emotions have been shows to counteract, or "undo," the effects of negative emotions. Decades of research support the idea that positive emotions are incompatible with negative emotions (Baron, 1976; Cabanac, 1971; Nezu, Nezu, & Blissett, 1988; Solomon, 1980; Wolpe, 1958). However, until recently, no research served to examine the direct impact that positive emotions had on negative states. Recent research shows that encouraging positive emotions can revert the cardiovascular effects, such as rapid heartbeat, of negative emotions such as fear (Fredrickson & Levenson, 1998) or anxiety (Fredrickson, Mancuso, et al., 1999). Positive emotions not only exact their own effects, but they also serve to resolve the negative effects of negative emotions.

Positivity thus appears to be a worthy goal. In fact, the pursuit of positive emotions, such as happiness, is built into our Declaration of Independence and it a tenet of the American lifestyle. It should then be no surprise that most people think about happiness on a daily basis (Freedman, 1978) and consider happiness to be very important to them (Diener, Suh, Smith, & Shao, 1995; Triandis, Bontempo, Leung, & Hui, 1990). Several reports show that a majority of people explicitly value happiness and set goals to attain it (Myers, 2000; Diener, 2000). Though these studies focused specifically on happiness, they may represent the widespread pursuit of positivity at large.

For some, however, this goal is less realistic. Consider depression, a disorder whose symptoms "often involve lack of positive emotion" (Seligman, Rashid, & Parks, 2006) or anxiety, which is characterized by negative intrusive thoughts (Aydin, 2009). Such disorders and

their milder counterparts represent a significant deficit in positivity for those who have them. Do these individuals simply "miss out" on the benefits of positive emotions, or can they be directed toward positivity?

Striving for Happiness

Practitioners of several models of therapy, such as positive psychotherapy or variations of cognitive-behavioral therapy, have addressed the issue of positivity in the context of disordered thinking (see Seligman, Rashid, & Parks, 2004 and Karlin et. al, 2012, for examples). These models emphasize the goal of gaining positivity rather than simply reducing negativity and have found marked success. Once more, achieving positive emotions, and not just reducing negative emotions, is the goal.

According to standard models of goal pursuit (e.g. Mischel, Cantor, & Feldman, 1996) valuing positivity and setting a goal to achieve it would lead one to feel more positive. One sets goals according to his or her values and then strives to achieve them, resulting in goal fulfillment. However, the specific case of positivity has a less straightforward path. In fact, some recent research suggests that actively seeking positive emotions may be detrimental.

While a person's values do determine his or her goals, such values also determine the standard against which progress toward the goal is compared (Carver & Scheier, 1981). When progress falls short of one's standard, the result is a shift from positive expectations to negative results (Miceli & Castelfranchi, 2000). This violation of expectations leads to frustration and thereby suffering (Miceli & Castelfranchi, 1997) and is the basis of a host of negative emotional experiences (e.g., Mandler, 1984; Scherer, 1984; Stein & Levine, 1987, 1990).

For most goals, disappointment does not directly detract from one's success at achieving the goal. Though a person is upset by their lack of progress, he can still continue toward and

ultimately achieve his goal. However, in the case of positivity, the suffering induced by failing to meet one's standards is in direct opposition to the goal (Schooler, Ariely, & Loewenstein, 2003). If a person values positive emotions, such as joy, he may set high expectations of what "joy" should be (Carver & Sheier, 1981). Then, in evaluating his joy compared to that standard, he is more apt to feel disappointed at his current level of joy. Because joy and disappointment are opposing states, his disappointment will lead him further from his goal of joy.

Mauss et al. (2011) describe such a goal as a "paradoxical" goal. In evaluating progress toward the goal, one pushes themselves farther away from achieving their goal. For instance, Shapira (2013) found that giving participants an explicit goal of being close to another led to decreased ratings of closeness. In attempting to monitor closeness, people observed more distance between themselves and therefore felt farther from their goal of closeness.

The effect is particularly strong for goals involving positive emotions. An early study by Schwartz and Inbar-Saban (1988) found that participants who highly valued happiness failed to lose weight in a long-term weight loss study, whereas those who prioritized wisdom were successful, suggesting a detrimental impact of valuing happiness. Later research investigated the particular mechanism behind this detriment. Mauss and colleagues found that when participants were led to value happiness, they reported increased feelings of loneliness (2012) and decreased levels of positive emotions at large (2011). This research suggests that the explicit goal of a positive emotions, such as happiness, is often what makes one less positive and leads to negative consequences.

Further, the damaging effects of striving for positivity seem to be especially detrimental to those who would most benefit from a goal of increased positivity. Wood, Perunovic, & Lee (2009) conducted a study in which participants were asked to repeat positive self-statements,

such as "I am a lovable person," and later report their mood. They found that while participants with high self-esteem reported limited mood repair after repeating such statements, those with low self-esteem reported significantly more negative mood after the repetition. The researchers theorize that this occurred because repeating the statement continuously called to mind reasons why the statement was not true, at least in the perception of the participants. The attempt to repair mood using this common mechanism backfired for those whose mood was most subject to negativity. Therefore, it appears that an explicit goal of positivity is commonly self-defeating. How, then, can we try to cultivate positive emotions?

Implicit Emotion Regulation

Implicit goals of emotion regulation may provide a solution. Evidence suggests that implicit, or automatic, goals can be just as potent as explicit, or conscious, goals (Bargh et al, 2001). For instance, Chartrand and Bargh (1996) found that giving participants an implicit goal of impression formation or of memorization changed the way they processed information in order to better suit their specific goal. Implicit goals can also change a person's behavior, leading them to cooperate more with a partner (Bargh et al, 2001), perform better on achievement tasks (Bargh et al, 2001), and be more honest on self-report measures (Rasinski, Visser, Zagatsky,& Rickett, 2004).

Such goals have also been effective with regard to emotions. In one study, Mauss, Cook, and Gross (2007) showed that participants who were primed with words concerning emotion control in a sentence unscrambling task, and thus given an implicit goal to control their emotions, demonstrated less reaction to an anger provocation. Further research suggests that those who implicitly value emotion regulation are more engaged in it and capable of it, leading to positive outcomes such as lower rates of depression and increased well-being (Hopp, Troy, &

Mauss, 2011). In fact, after finding that implicit positivity could be boosted by activating one's concept of the self with self-referential primes, researchers found that increased implicit positivity decreased negative affect (Quirin, Bode, & Kuhl, 2011). It seems that, given the right implicit motivation, the emotion regulation system can be guided away from negative emotions and toward more positive outcomes without actively trying to "feel better."

Another line of research suggests that such implicit goals may be influencing a preexisting automatic emotion regulation system. Gilbert et al. (1998) posit the existence of a "psychological immune system." When faced with negative emotions, the psychological system shuts down responses to the negative emotions and instead attends to more positive stimuli to adjust mood. Research supports this notion. For instance, DeWall and Baumeister (2007) found that reminding participants of the notion of death facilitated access to positive emotional information and enhanced attention to positive over neutral stimuli. In the presence of negative thoughts, attention automatically shifted to positive stimuli, presumably to improve mood. In a different study, DeWall et al. (2011) found that after failing to be selected to be part of a social group, participants recalled a greater proportion of positive childhood memories on an ostensibly unrelated recall task. Social rejection thus increased implicit positive affect. When presented with negative situations, people begin to engage implicit positivity on a nonconsious level.

Work on automatic thoughts supports the idea of an automatic tendency toward mood repair on a cognitive level. Smallwood, Fitzgerald, Miles, and Phillips (2009) found that participants who were induced to feel negative affect demonstrated more mind-wandering, indicating a greater presence of automatic, rather than controlled, thoughts. If negative affect results in both mind-wandering and mood repair, we hypothesize that an increased amount of positive automatic thoughts may account for increased positive affect. Indeed, the results of a

study conducted by Lightsey et al. (2013) confirm that having more positive automatic thoughts is associated with increased positivity. To date, no studies have investigated the mediating effects of positive automatic thoughts on mood repair.

If an automatic mood regulation system exists and is sensitive to implicit goals, then implicit goals of positivity may provide a solution to the pitfalls of consciously seeking positivity. Because implicit goals are nonconscious, progress toward them cannot be constantly monitored. Such goals should eliminate the disappointment that one feels when "positivity" is not adequately attained and should allow one to continue seeking, and eventually achieve, greater levels of positivity.

The Present Study

In the present study, we aim to test the hypothesis that implicit goals of positivity are more effective than explicit goals in repairing a negative mood. We intend to engender implicit emotion regulation goals through the use of environmental cues. Because such cues can easily be used in a day-to-day environment, the successful use of such cues to prompt implicit goals will provide a practical application of implicit goal research by providing a mechanism that is accessible to those outside of the lab environment. Custers and Aarts (2005) suggested that environmental cues may enhance the "mental accessibility of goal representations" and prompt implicit goals, an idea which has found empirical support. For instance, commercial "primes" for snack foods increased unhealthy eating habits at home (Harris et al., 2009). On a more positive note, a study by Papies and Hamstra (2010) found that the use of posters encouraging healthy eating behavior led participants to consume less snack items from a grocery sample counter. Environmental cues can influence implicit goals and drive thoughts and/or behavior.

In sum, we will examine whether implicit goals of positivity, as driven by environmental cues, are more effective in aiding recovery from a negative mood. This design will particularly examine the mechanism of positive automatic thoughts. We expect that mood repair will be predicted by the incidence of positive automatic thoughts. In other words, more positive thoughts will predict greater mood repair.

This study will make use of a 2 X 2 experimental design. Differing instructions in a thought-listing task will determine whether or not the participant is using an explicit goal to improve mood. The instruction type will be crossed with the valence of the environmental cues, either positive or negative, to vary the nature of the implicit goal. Positive cues will give an implicit goal, while neutral cues will not. The 2 X 2 design will allow us to determine if the nonconscious, automatic mood regulation system is actually more effective and whether or not that system can be influenced by environmental stimuli.

We expect a main effect of instruction type such that those in the automatic thought condition will demonstrate greater recovery from negative mood than those in the directed thought condition as measured by mood repair, thought valence, proportion of positive thoughts, and number of positive thoughts. Further, we expect an interaction of instruction type and cue valence such that, within the automatic thought condition, those given positive thought cues will demonstrate greater recovery than those given neutral thought cues due to the implicit goal of positivity.

Additionally, we will explore several secondary hypotheses. As the effectiveness of explicit versus implicit goals of emotion regulation is yet to be explored, it is possible that the effect will be moderated by individual differences that this design does not account for. Therefore, we will also investigate the effect of several trait measures on the outcome of this

design. We expect that individuals with a high level of rumination will exhibit decreased recovery from negative emotion across conditions, leading to a main effect of level of rumination on resultant positivity. However, we expect that, among ruminators, the use of an implicit goal of positivity will indeed be more effective than an explicit goal. Similarly, we expect that individuals exhibiting greater pessimism will demonstrate decreased recovery from negative mood across conditions, but that, among pessimists, the use of an implicit goal will be more effective. If these individual differences do impact the results of the primary analyses, our secondary hypotheses will allow a more complete understanding of the results.

Method

Participants

One hundred and sixty five participants from the University of North Carolina at Chapel Hill were recruited for this study. All participants were students of General Psychology courses on campus and registered anonymously for sessions via an online university participant pool. Each participant was compensated with partial class credit for their participation.

Of the students that participated, 127 were women and 36 were men. Two participants did not provide gender information. Participants were aged 17-21 with an average age of 18.4. The ethnic composition was mixed: 72.6% Caucasian, 8.5% African American, 9.1% East Asian, 4.2% South Asian, and 5.5% reporting other ethnic identities.

Procedure

Participants arrived at the lab and were seated in a cubicle designed to resemble the office of the researcher. The cubicle contained a standard set of materials including research books, a weekly calendar, and several personal pictures. In addition, a series of quotes and images were placed on the walls of the cubicle.

The content of the quotes and images varied by experimental condition. In the *positive* condition, the stimuli focused on the goal of being positive. In the *neutral* condition, the stimuli were centered on the topic of research. All stimuli were matched for color, size, and amount of text to control for extraneous variables.

Before beginning the session, participants were given a brief overview of the experimental setup and were asked to give their informed consent. Participants were then asked to engage in a brief writing task. The task was intended to be a negative mood induction in which participants were asked to write about a recent negative experience in which they felt sadness, fear, or shame. This method has been shown to have an effect on mood lasting approximately 15 minutes and therefore fit the study time frame (Abele, 1990). Mood was assessed immediately following the task.

Following the mood induction, participants engaged in a thought listing task. The paradigm was modeled from a study by Cacioppo, Glass, and Merluzzi, (1979). In each condition, participants were asked to list "any and all thoughts" that crossed their mind in a three minute time frame. The specific instructions varied by condition. In the *automatic* condition, participants were simply asked to list all of their thoughts. In the *directed* condition, participants were given the additional instruction to try to "improve their mood" and "feel better." These two conditions were crossed with the two cue conditions to create a fully crossed 2 X 2 design. As they listed each thought, participants were asked to rate the automaticity of each thought.

A second mood evaluation was conducted after the thought listing task in order to assess mood improvement. Afterward, participants were asked to return to their thought task and rate the valence of each thought.

To conclude the study session, participants completed a variety of surveys to assess levels of rumination and life orientation. Demographic information was collected at this time.

Before leaving, all participants were debriefed about the true nature of the study and provided with information regarding counseling resources in the event that the writing task provoked any lingering emotional distress.

Measures

Mood evaluation: The affect grid (Russell, Weiss, & Mendelsohn, 1989) assesses mood on a nine by nine grid along dimensions of valence and arousal. The four quadrants of the grid represent variable levels of energy and pleasantness. For example, a response in the upper right of the grid represents positive valence and high arousal indicative of emotions such as joy. A lower left quadrant response represents negative valence and low arousal, as seen in depression. Participants are asked to select one box on the grid that best represents their feelings in the present moment. Each dimension is coded separately on a scale of -4 to 4. Mood repair will be calculated by subtracting the mood valence scores of the pre-thought task mood evaluation from those of the post-thought task mood evaluation.

Thought Automaticity: Participants were directed to rate how automatic each thought they listed was on a scale of 1, or *not at all automatic*, meaning that they had to consciously conjure that thought, to 5, or *entirely automatic,* meaning that the thought simply popped into their mind. The scale was described to each participant as written above. The automaticity scores of each thought were averaged to provide a summary score for thought automaticity.

Thought Valence: Participants rated the valence of each thought listed on a scale of 1, meaning *very negative,* to 5, meaning *very positive.* A rating of 3 suggested a neutral thought.

The valence scores of each thought were averaged to provide a summary score for thought valence.

Rumination: The Ruminative Responses Scale (Treynor, Gonzalez, & Nolen-Hoeksema, 2003) assesses one's typical ruminative tendencies, including the tendency to dwell on past negative events and linger in negative moods. It contains 22 items and is assessed on a 1, meaning *almost never*, to 4, meaning *almost always,* Likert scale. The scale includes items such as "How often do you think about how sad you feel?" and "How often do you analyze recent events to try to understand why you are depressed?" In this study, several items were edited to better reflect sad mood rather than depression and to inquire about a school, rather than a work, setting to better suit the sample population. The scores of each item were summed to provide a total rumination score. Higher scores indicate higher levels of rumination. The scale demonstrated high reliability in this study (α=.907).

Life Outlook: The Life Orientation Test – Revised (Scheier, Carver, & Bridges, 1994) was used to assess optimism. The scale measures one's overall outlook on life, typified as optimism or pessimism. It contains ten statements to which participants respond from 1, meaning *I disagree a lot*, to 5, meaning *I agree a lot.* Sample items include "I'm always optimistic about my future" and "In uncertain times, I usually expect the best." Three items, including "I hardly ever expect things to go my way," are reverse scored. All scores are averaged to provide a mean representative score for life orientation. This scale showed adequate reliable in this study (α=.810).

Results

Manipulation Checks

Manipulation checks were used to assess the effectiveness of the negative mood induction and of the thought instructions. Participants in all conditions should have reported consistently negative mood following the negative mood induction. However, on average, mood was neutral (M = 0.26, SD = 2.22). A one-way analysis of variance showed that there was no significant differences in mood valence between groups following the mood induction, $F(3,163) = 0.455$, $p < 0.714$, signifying that all groups responded equally to the induction. The median reported mood valence was 0.00, and nearly half (48.2%) of participants reported positive mood (Table 1; Figure 1). Despite the lack of negative response to the manipulation, all participant data were retained for analysis.

Participants in the automatic thought condition should have reported more automatic thoughts than those in the directed thought condition as they were not given an explicit goal for how to think. However, no significant differences in thought automaticity were found between the two thought instruction conditions. A t-test returned no significant difference in average thought automaticity between the directed (M = 3.47, SD = 0.65) and the automatic (M = 3.43, SD = 0.58) thought conditions, $t = 0.397$, $p < 0.692$. Means for both groups were neutral. A separate t-test yielded no significant difference in the proportion of automatic thoughts reported between the directed (M = 0.52, SD = 0.25) and the automatic (M = 0.52, SD = 0.22) thought conditions, $t = -0.044$, $p < 0.965$. Furthermore, there was no significant difference in the total number of thoughts reported between the directed (M = 12.64, SD = 6.08) and the automatic (M=12.55, SD = 5.5), $t = 0.105$, $p < 0.917$. The manipulation checks did not support the effectiveness of the varying thought instructions between the two groups.

Primary Hypotheses

Among the total sample, mean mood repair was 0.75 (SD = 2.29), mean thought valence was 3.14 (SD = 0.63), and the mean thought ratio (number of positive thoughts of total thoughts) was 0.39 (SD = 0.22). As expected, increases in mood repair were predicted by an increase in positive automatic thoughts. Mood repair was significantly correlated with both average thought valence ($r = 0.244$, $p < 0.002$) and with the proportion of positive thoughts recorded ($r = 0.254$, $p < 0.001$). These correlations are represented in Figure 2 and Figure 3, respectively. R-values are summarized in Table 2.

Recovery from negative mood, or resultant positivity, following the thought task was assessed using four dependent variables: change in reported mood (hereafter referred to as 'mood repair'), average valence of reported thoughts ('thought valence'), proportion of positive thoughts of all thoughts reported ('proportion of positive thoughts'), and total number of positive thoughts reported. Each dependent variable was subjected to a two-way analysis of variance with two levels of instruction type (directed or automatic) and two levels of environmental cues (neutral or positive).

Contrary to hypotheses, there was a main effect of instruction type for all four dependent variables such that those in the directed thought condition demonstrated significantly greater resultant positivity than those in the automatic thought condition (Table 3; Figure 4). The analysis yielded a main effect for instruction type, $F(1,161) = 10.243$, $p < 0.002$, such that mood repair was significantly greater in the directed thought condition ($M = 1.321$, $SD = 0.249$) than in the automatic thought condition ($M = 0.202$, $SD = 0.245$). The main effect of instruction type on thought valence was also significant, $F(1,161) = 6.159$, $p < 0.014$, indicating that thoughts were significantly more positive in the directed thought condition ($M = 3.267$, $SD = 0.069$) than in the automatic thought condition ($M = 3.026$, $SD = 0.068$). Likewise, a main effect emerged for

instruction type on proportion of positive thoughts, $F(1,161) = 8.945$, $p < 0.003$, meaning that there was a greater proportion of positive thoughts in the directed thought condition ($M = 0.438$, $SD = 0.025$) than in the automatic thought condition ($M = 0.335$, $SD = 0.024$). Finally, the analysis returned a main effect of instruction type on number of positive thoughts, $F(1,161) = 6.202$, $p < 0.014$, such that a significantly higher number of positive thoughts was reported in the directed thought condition ($M = 6.142$, $SD = 0.494$) than in the automatic thought condition ($M = 4.417$, $SD = 0.485$).

Also contrary to predictions, the analyses yielded no significant interactions. The interaction between instruction type and cue type was insignificant for mood repair [$F(1,161) = 0.089$, $p = 0.766$], thought valence [$F(1,161) = 0.208$, $p = 0.649$], proportion of positive thoughts [$F(1,161) = 0.220$, $p = 0.640$], and for number of positive thoughts [$F(1,161) = 1.781$, $p = 0.184$]. Across all dependent variables, then, the thought instructions produced a similar unexpected effect regardless of cue type.

Secondary Hypotheses

Because the expected results were not demonstrated in the full sample, trait rumination and trait pessimism were explored as potential moderating factors. Each trait was first used in a two-way analysis of variance as an independent variable with two levels (high trait level and low trait level). A 2 X 2 ANOVA (trait level X instruction type) was conducted on the sample. The "cue type" variable was removed from this analysis to isolate the impact of instruction type on each group in these analyses. All results are summarized in Table 4.

Scores on the Rumination Scale were used to split the sample. The sample was split at the median rumination score (median = 50) to create a high rumination group and a low rumination group. The four dependent variables for resultant positivity, as described above,

were analyzed using a two-way analysis of variance with two levels of instruction type (directed and automatic) and two levels of rumination (low or high).

As expected, there was a main effect of rumination level on several measures of resultant positivity. The two-way analysis of variance yielded a significant main effect of rumination level on average thought valence, $F(1, 161) = 11.650$, $p < 0.001$, such that thoughts were significantly less positive among high ruminators ($M = 2.986$, $SD = 0.066$) than low ruminators ($M = 3.306$, $SD = 0.067$). The main effect of rumination level on proportion of positive thoughts was also significant, $F(1,161) = 4.954$, $p < 0.027$, such high ruminators reported significantly fewer positive thoughts ($M = 0.348$, $SD = 0.024$) than low ruminators ($M = 0.424$, $SD = 0.024$). However, there was no main effect of rumination level on mood repair ($F(1,161) = 0.00$, $p = 0.992$) nor on number of positive thoughts ($F(1,161) = 0.867$, $p = 0.353$).

There was, however, a significant interaction between level of rumination and instruction type on mood repair, $F(1,161) = 4.907$, $p < 0.028$, such that whereas ruminators in the directed thought condition demonstrated less mood repair, those in the automatic thought condition demonstrated greater mood repair (Figure 4). However, no significant interactions between level of rumination and instruction type were found for thought valence *[F(*1,161) = 1.477, $p = 0.226$], proportion of positive thoughts *[F(*1,161) = 2.169, $p = 0.143$], nor number of positive thoughts *[F(*1,161) = 1.181, $p = 0.279$].

Following those analyses, those in the high trait group were isolated and the resulting sample was subjected to a 2 X 2 ANOVA (rumination X instruction type). The original hypotheses were then retested on the high ruminating group alone (N = 78). A two-way analysis of variance was conducted for each of the four dependent variables with two levels of instruction type (directed and automatic) and two levels of cue type (neutral and positive). There was no

main effect of instruction on mood repair *[F(*1,74) = 0.530, *p* = 0.469], thought valence [*F*(1,74) = 0.148, *p* = 0.702], proportion of positive thoughts *[F (*1,74) = 0.629, *p* = 0.430], or number of positive thoughts *[F(*1,74) = 0.417, *p* = 0.521] among the high ruminating group.

However, there was a marginally significant interaction of instruction type and cue type on positive thoughts, *F*(1,74) = 3.638, *p* < 0.060, such that while ruminators in the automatic thought condition reported fewer positive thoughts in the neutral cue condition, those in the positive cue condition reported more positive thoughts (Figure 5). There was no significant interaction of instruction type and cue type on mood repair [F(1,74)=0.088, p=0.768], thought valence [F(1,74)=0.694, p=0.407], or proportion of positive thoughts [F(1,74)=0.403, p=0.528]. There was some evidence that, whereas the expected interactions were not present in the full sample, they surfaced in the ruminative subset.

Similar analyses were performed regarding trait pessimism. Scores on the Life Orientation Test-Revised were used to split the sample. The sample was split at the median score (median=3.2) into high and low pessimism groups. A two-way analysis of variance was conducted for each of the four dependent variables with two levels of instruction type (directed and automatic) and two levels of life outlook (pessimist and optimist).

There was a main effect of life outlook on several of the dependent variables. The two-way analysis of variance returned a main effect of life outlook on thought valence, *F*(1,161) = 12.084, *p* < 0.001, such that thoughts were significantly less positive among the high pessimism group (*M* = 2.957, *SD* = 0.072) than among the low pessimism group (*M* = 3.287, *SD* = 0.062). There was also a main effect of life outlook on the proportion of positive thoughts, *F*(1,161) = 9.085, *p* < 0.003, such that there was a significantly smaller proportion of positive thoughts among the high pessimism group (*M* = 0.327, *SD* = 0.026) than among the low pessimism group

(*M* = 0.430, *SD* = 0.022. Finally, the main effect of life outlook on the number of positive thoughts reported was marginally significant, *F*(1.161) = 3.066, *p* < 0.082, such that fewer positive thoughts were reported among the high pessimism group (*M* = 4.566, *SD* = 0.526) than among the low pessimism group (*M* = 5.784, *SD* = 0.456). However, there was no main effect of life outlook on mood repair, *F*(1,161) = 1.187, *p* < 0.654.

There was no significant interaction of instruction type and life outlook on mood repair *[F(*1,161) = 0.202, *p* = 0.654], thought valence *[F(*1,161) = 0.715, *p* = 0.399], proportion of positive thoughts *[F(*1,161) = 0.266, *p* = 0.607], nor number of positive thoughts *[F(*1,161) = 1.006, p = 0.317].

As with the rumination analyses, the primary hypotheses were then tested on the high pessimism group alone. A two-way analysis of variance was conducted for each of the four dependent variables with two levels of instruction type (directed and automatic) and two levels of cue type (neutral and positive).

There were no significant results in these analyses. There was no main effect of instruction on mood repair *[F(*1,67) = 2.725, *p* = 0.103], thought valence *[F(*1,67) = 0.638, *p* = 0.427], proportion of positive thoughts *[F(*1,67) = 2.162, *p* = 0.146], nor number of positive thoughts *[F(*1,67) = 0.525, *p* = 0.471]. There was also no interaction of instruction type and cue type on mood repair *[F(*1,67) = 0.047, *p* = 0.829], thought valence *[F(*1,67) = 0.638, *p* = 0.427], proportion of positive thoughts *[F(*1,67) = 0.065, p = 0.800], nor number of positive thoughts *[F(*1,67) = 0.209, *p* = 0.649]. Trait pessimism did not seem to have any impact on the effect of the manipulation.

Discussion

This study was designed to test whether implicit goals of positivity could be more effective in improving negative mood than explicit goals. Evidence suggests that explicit goals to be more positive can backfire, but according to recent evidence, implicit goals could avoid this issue. It was expected that participants given an implicit goal, as prompted by positive environmental cues, would exhibit greater recovery from negative mood than participants who were simply told to try to feel better.

Unfortunately, this design did not support the primary hypotheses. According to the data, it was found that individuals with an explicit goal of positivity reported greater positivity as represented by better mood, more positive thought valence, a greater proportion of positive thoughts, and a greater total number of positive thoughts. The "backfiring" effect of striving for positivity that was present in previous studies was not supported by this design - those given an explicit goal actually fared better. The automatic mood repair system, as prompted by environmental cues, was less effective in this experiment.

It is possible that the hypotheses were well founded, but this design was not adequate to support them. There were several flaws in this design that could have detracted from its overall success. First and foremost, the manipulations were not effective. The analyses suggest that the negative mood induction only worked for approximately 50% of participants (see Table 1). If participants were not feeling negative to begin with, there would be no negativity to contrast with the goal of positivity. Therefore, the explicit goal would fail to be "paradoxical" to begin with and there would then be no reason to expect a backfiring effect of the goal. If one is already positive or even neutral, then the explicit goal of positivity becomes an easy goal to attain. Furthermore, without negative emotions present, there is no reason for the nonconscious mood

repair mechanism to take action, meaning that implicit goals would also fail to be effective. Without the presence of negativity at the start of this experiment, the primary hypotheses could not be properly tested. Further investigation of these hypotheses would benefit from a more effective mood induction.

It may be that this particular mood induction was not well standardized. Each participant was required to reflect on a personal experience and write about it. Effectiveness may thus vary according to each participant's motivation and ability to pursue such reflection. One way to improve effectiveness would be to place the induction in the hands of the experimenter. Studies have supported the use of a storytelling mood induction in which the experimenter reads a story with a distinct emotional tone (such as sadness) to the participant and instructs them to imagine that the events of the story are happening to them (Morrow & Nolen-Hoeksema, 1990). Using this method would ensure that each participant was given the same stimulus and dedicated the same amount of time to the induction. This method has been effective for inducing both sadness and anxiety in prior studies and may be more effective in a design like this (Morrow & Nolen-Hoeksema, 1990).

The data also failed to support the effectiveness of the manipulation of thought instructions. If the manipulation had worked, then those in the directed thought condition should have reported less automatic thoughts as they should have been focused on their goal of improving their mood. However, the data show that there were no differences in thought automaticity between groups. Therefore, it may be that those in the directed thought condition ignored their explicit goal. Without that goal, there would be no reason for the "backfiring," as the goal was not present to begin with, providing another reason that the hypotheses may not have been supported.

This design was also susceptible to demand characteristics. The design called for the use of an explicit goal, meaning that individuals were told exactly what they were supposed to do. Unfortunately, it also made use of an explicit measure. Participants were asked to try to feel better and were then asked to report how they felt. If the typical model of demand characteristics is applied here, then it may not be surprising that participants would report feeling better on the second mood evaluation because they believed that is what they were "supposed" to do. The data are consistent with this explanation. Participants in the directed thought condition reported feeling more positive and having more positive thoughts than did those in the automatic thought condition. While other measures were used to try to combat the demand characteristics, the use of such explicit measures to measure the outcome of an explicit goal was a clear pitfall of this design.

The use of implicit mood measures may have added clarity to the results of this study. For instance, the recently-developed Implicit Positive and Negative Affect Test (IPANAT) presents participants with nonsense words from a fictional language and asks them to rate the extent to which the words express a variety of affective states (Quirin & Bode, 2014). Because the words have no inherent meaning, it is presumed that participants will project their implicit affect onto the meaning of the word. This measure is less subject to demand characteristics and may be able to shed light on any effects this design has on implicit affect.

The final issue with this design concerns the sample. While not quite a "problem," the fact remains that the sample used for this study was a healthy sample. A majority of the participants reported low rumination scores, as the mean was 48.1 of a possible 88 and 75% of participants fell below a score of 57 (see Figure 7). These individuals would have a reduced tendency to dwell on negative thoughts, such as those induced by the writing task, and therefore

may have been perfectly capable of calling positive thoughts to mind when given a direct goal to try to be positive. If this were the case, then the explicit goal of positivity would have worked perfectly and there would be no need to find a "more effective" mechanism, such as an implicit goal. It may be that with a less healthy sample, such as those prone to negative cognitive patterns, the hypotheses would have been better supported.

Indeed, analysis of the secondary hypotheses supports this idea. When comparing those with a greater tendency to ruminate to those with a lesser tendency to do so, the expected trends begin to emerge. For instance, even though they showed less mood repair in the directed thought condition, ruminators showed greater mood repair in the automatic thought condition. This suggests that while an explicit goal is effective for non-ruminators, it may indeed be detrimental to ruminators. Further, when separating the ruminators from the rest of the sample, the predicted interaction between instruction and cue type emerged, albeit at the level of a trend. For instance, those in the automatic thought condition reported a greater number of positive thoughts when surrounded by positive cues. Indeed, for this group, the use of an implicit goal seemed to be effective. With this in mind, the idea that the sample was simply "too happy" becomes more plausible. It may be that the hypotheses would have been better supported if those in the sample had a greater tendency to ruminate. While there was not an overwhelming amount of support for the moderating effect of rumination, it is certainly worth exploring in future studies.

While the primary hypotheses did not find support in this study, the results obtained through analysis of the secondary hypotheses warrant further investigation. The literature clearly supports the notion that, for those prone to negative thoughts, actively trying to be positive can be detrimental. For those people, an implicit goal of positivity, such as one induced by one's environment, may be the better option. Had the sample been limited to those with higher

rumination scores and thereby a greater tendency to dwell on negative thoughts, these hypotheses may have found better support. The data regarding the ruminative sample support this notion and is worth exploring.

Future studies will also benefit from the flaws discovered in this study. The writing task mood induction proved ineffective here, but an improved mood induction could enable a proper test of the hypotheses. Furthermore, the inclusion of more implicit mood measures as dependent measures may elucidate effects of explicit versus implicit goals that were obscured in this study due to demand characteristics. All in all, though the results of this particular design did not turn out as expected, the study was a useful first step. There is sufficient evidence here to warrant further test of these hypotheses, and hopefully future studies will be able to support the effectiveness of implicit goals in improving mood in those for whom explicit goals prove detrimental. Research has prompted the search for an emotion regulation system that is not subject to the potential problems of explicit goals; this study provides a lead for such a system. If positive cues placed in one's environment can indeed stimulate positive thoughts and thereby increase a person's positivity, as was true for certain individuals in this study, then using such cues provides a mechanism of recovery from negative emotions that is less subject to backfire. Considering the abundance of models that emphasize actively changing one's thought patterns, evidence supporting a more passive model sheds light on a new approach to recovery from negative emotions and/or cognitive patterns. This mechanism could be instrumental in improving outcome for those who are prone to negativity by providing a "first step" to recovery from negative emotions. Implicit goals of positivity could be used to start the generation of more positive thoughts. When enough positive thoughts exist, and negative thoughts are thus reduced, then more explicit and active forms of achieving positivity become less "paradoxical" and more

likely to succeed. In this way, the use of an implicit mechanism of mood repair could be used to supplement more explicit models for those people who need more of a push toward positivity.

Index:

Table 1: Frequencies of Mood Valence Scores after Mood Induction

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	-4	4	2.4	2.4	2.4
	-3	12	7.2	7.3	9.8
	-2	33	19.9	20.1	29.9
	-1	22	13.3	13.4	43.3
	0	14	8.4	8.5	51.8
	1	16	9.6	9.8	61.6
	2	29	17.5	17.7	79.3
	3	27	16.3	16.5	95.7
	4	7	4.2	4.3	100.0
	Total	164	98.8	100.0	
Missing	System	2	1.2		
Total		166	100.0		

Figure 1: Frequencies of Mood Valence Scores after Mood Induction

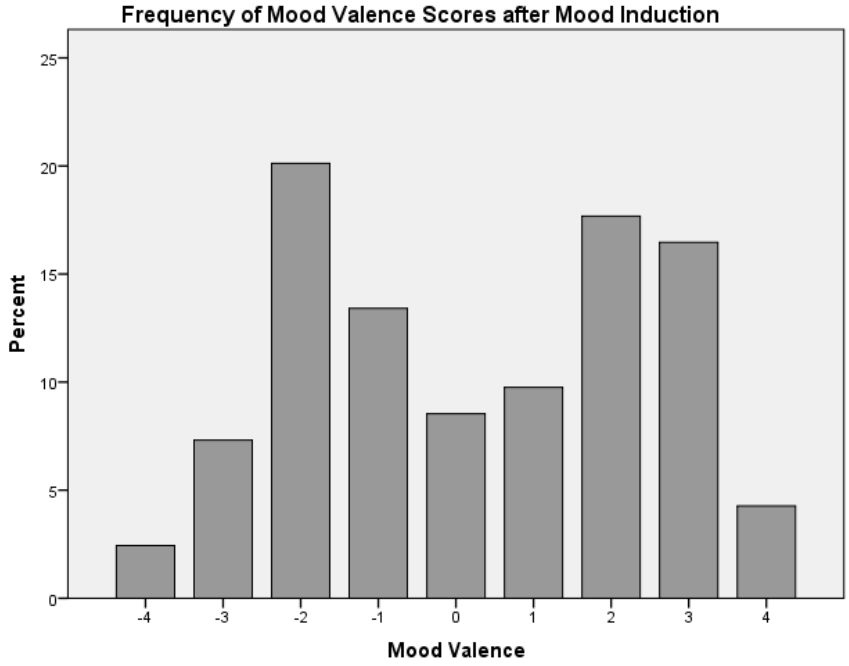


Table 2: R-values for correlations

	R-value	P-value
Mood repair and thought valence	0.244	0.002
Mood repair and proportion of positive thoughts	0.254	0.001

Figure 2: Correlation of Mood Repair and Average Thought Valence

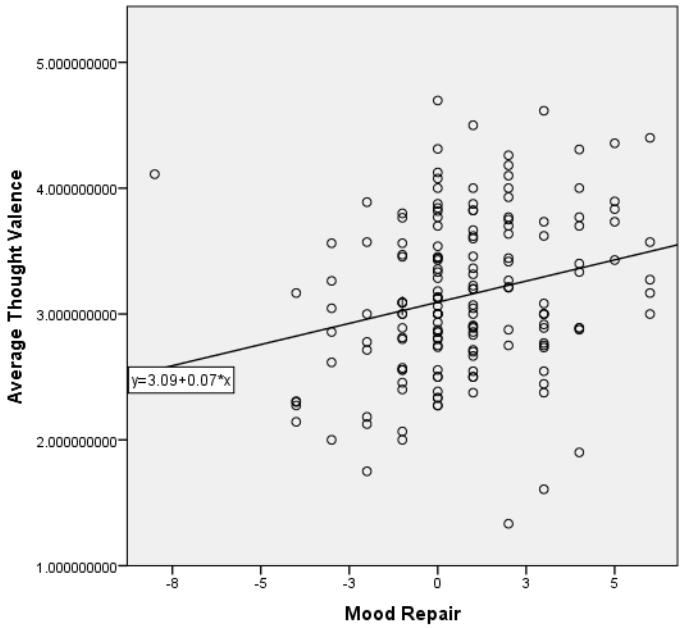


Figure 3: Correlation of Mood Repair and Proportion of Positive Thoughts

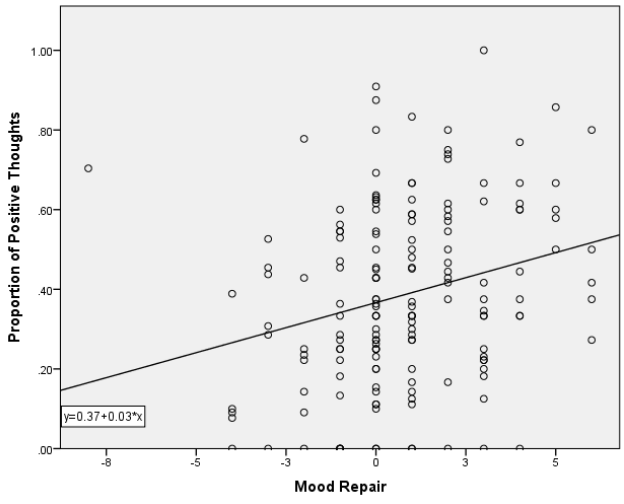
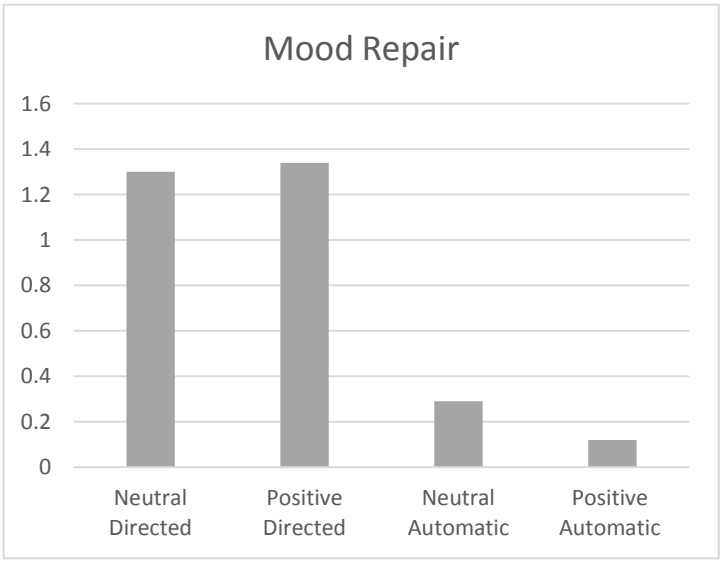
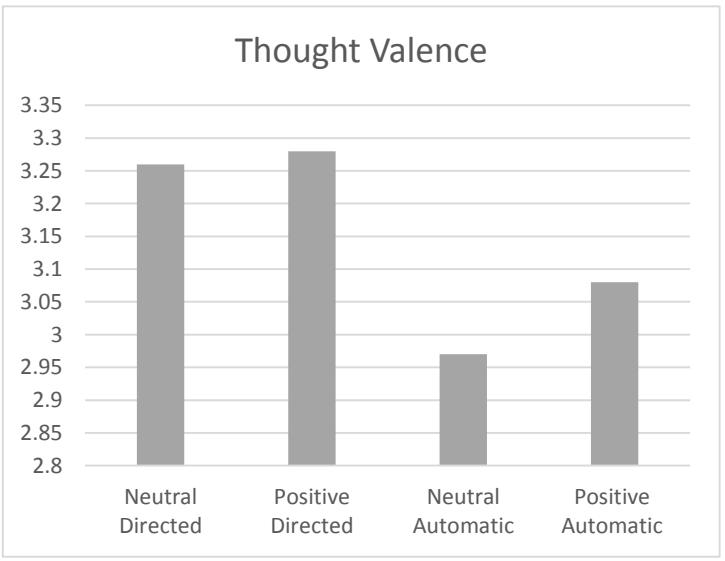


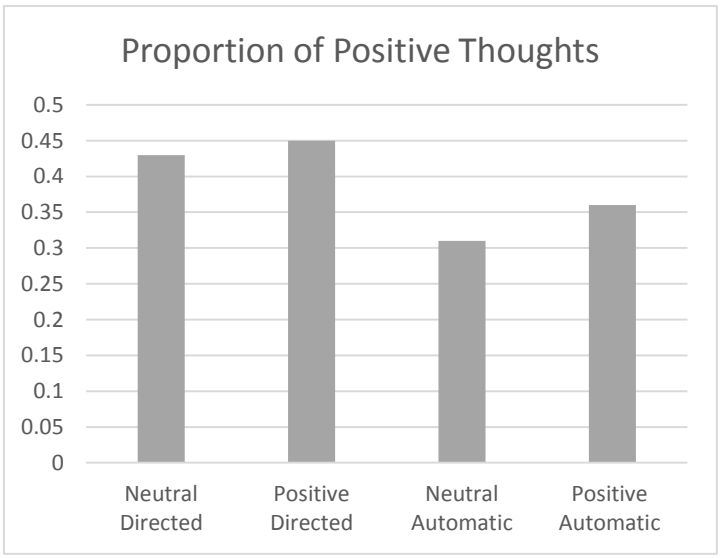
Table 3: Summary of Means for Primary Hypotheses (Full Sample)

CONDITION	Mood Repair	Thought Valence	Proportion of Positive Thoughts	Number of Positive Thoughts
Neutral Directed	1.30	3.26	0.43	6.65
Positive Directed	1.34	3.28	0.45	5.63
Neutral Automatic	0.29	2.97	0.31	4.00
Positive Automatic	0.12	3.08	0.36	4.83

Figure 4: Means for Resultant Positivity Across Conditions (Full Sample)







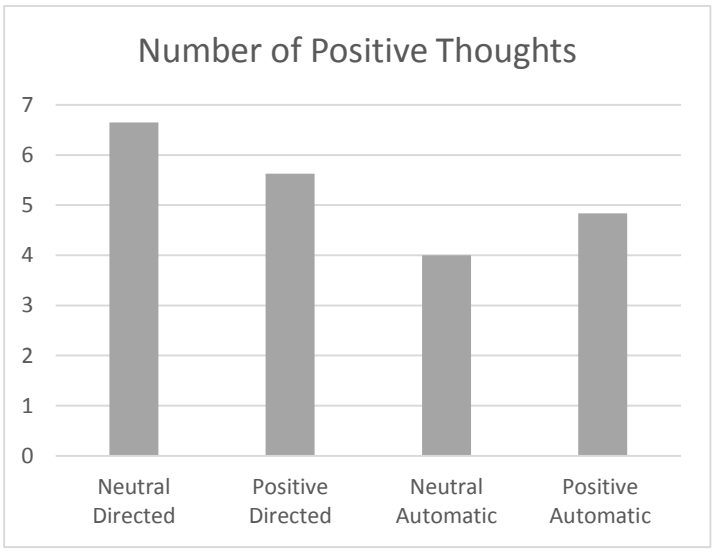
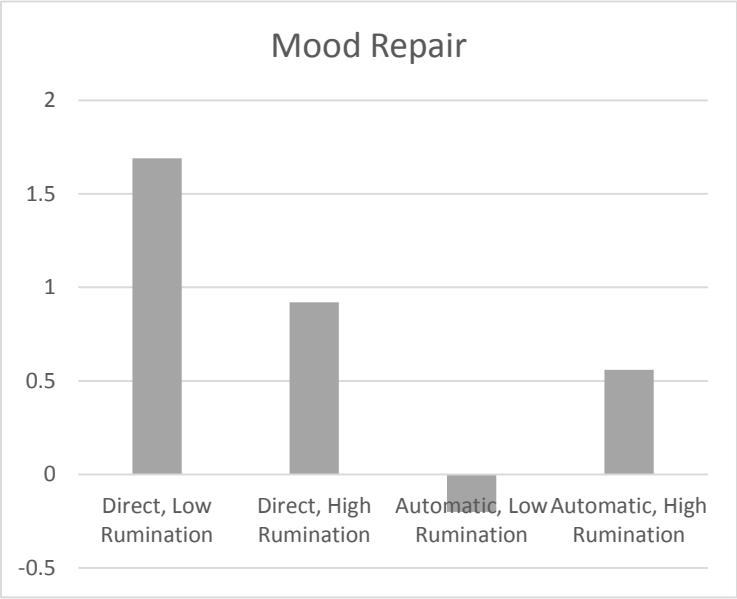


Table 4: Resultant Positivity for Secondary Hypotheses

	Mood Repair	Thought Valence	Proportion of Positive Thoughts	Number of Positive Thoughts
High ruminators	0.78	3.31	0.43	5.63
Low ruminators	0.73	2.98	0.35	4.9
Optimists	0.94	3.29	0.43	5.81
Pessimists	0.51	2.95	0.32	4.53

Figure 5: Interaction of Level of Rumination and Instruction Type on Mood Repair



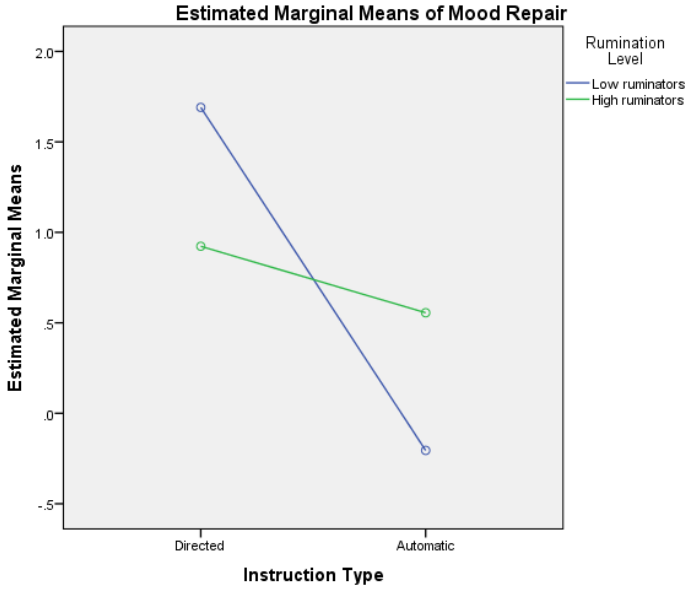


Table 5: Summary of Means for Primary Hypotheses (Ruminators Only)

CONDITION	Mood Repair	Thought Valence	Proportion of Positive Thoughts	Number of Positive Thoughts
Neutral Directed	1.25	2.98	0.34	6.2
Positive Directed	0.53	2.99	0.380	4.33
Neutral Automatic	0.70	2.80	0.27	3.43
Positive Automatic	0.30	3.07	0.37	5.70

Figure 6: Interaction of Instruction Type and Cue Type on Number of Positive Thoughts

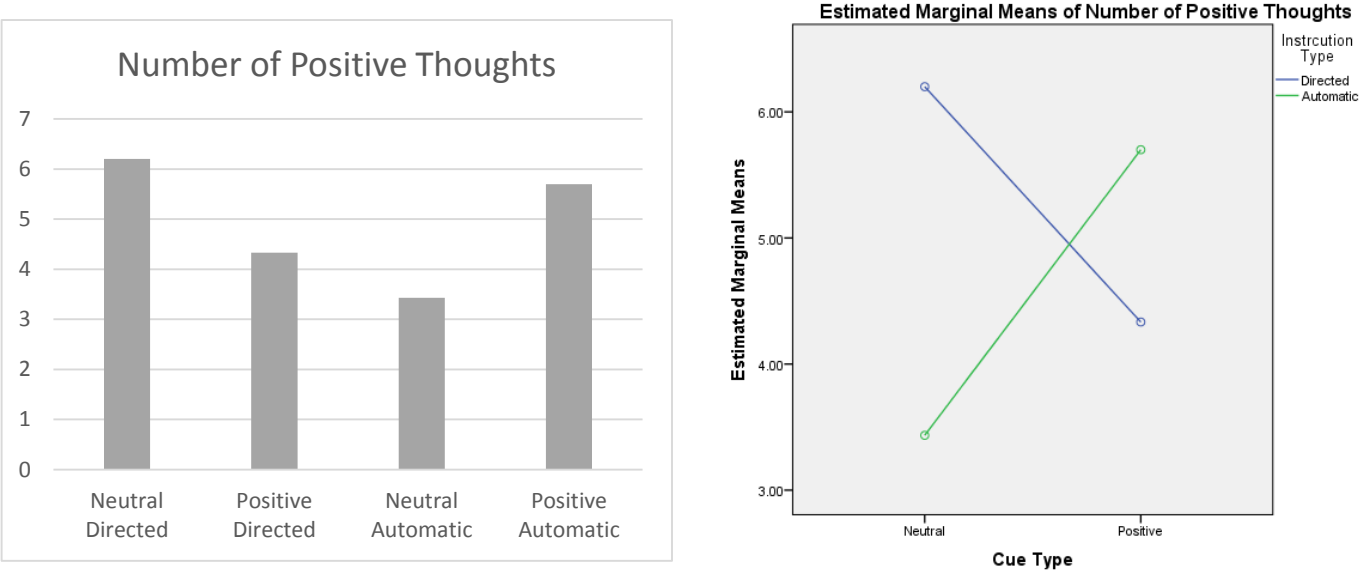
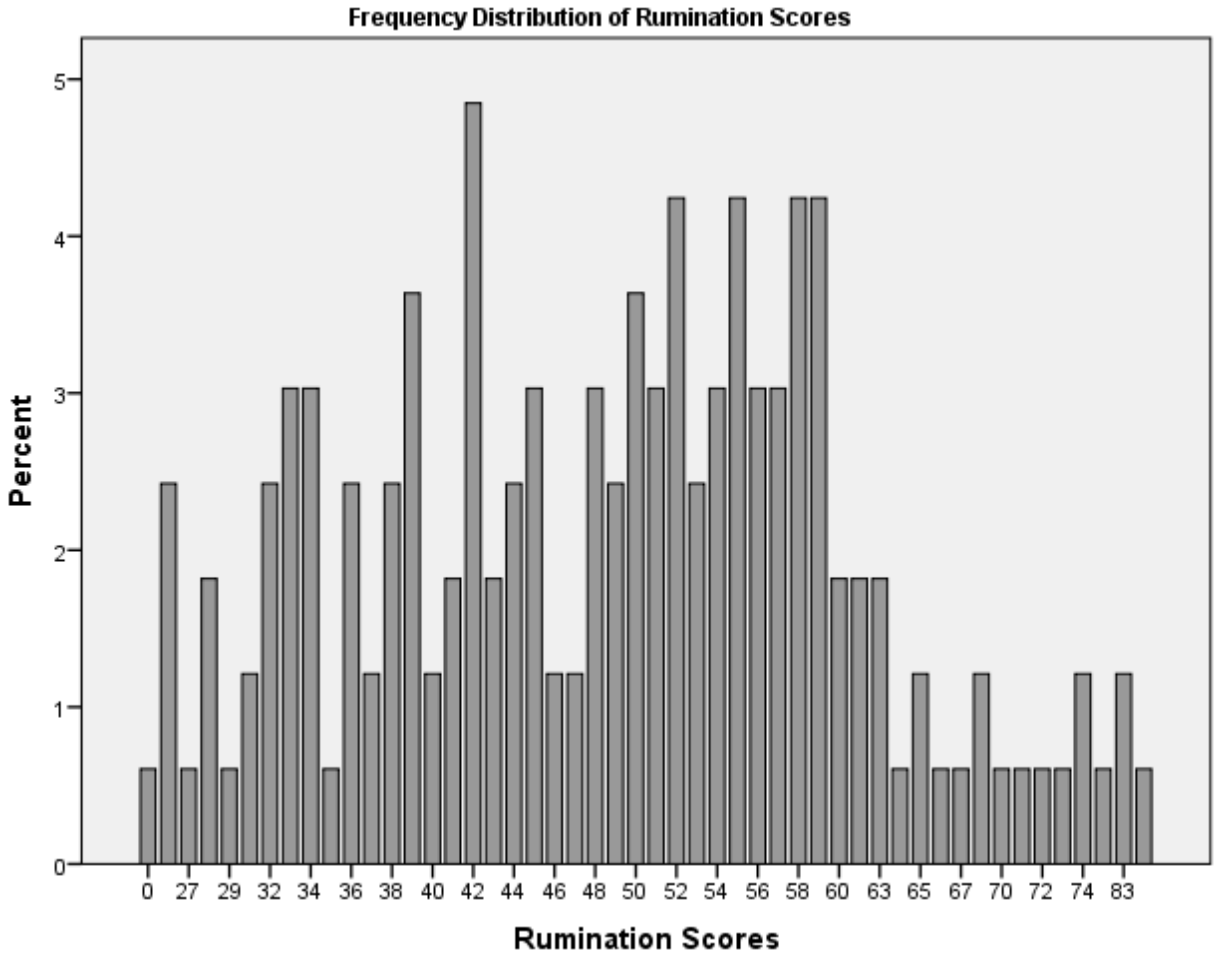


Figure 7: Frequency Distribution of Rumination Scores



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